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EXAMINER	
MOORE, IAN N	
ART UNIT	PAPER NUMBER
2661	

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9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/624,085	LEE ET AL.	
	Examiner	Art Unit	
	Ian N Moore	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 11 is/are allowed.

6)☒ Claim(s) 1,4-7,9,12 and 13 is/are rejected.

7)☒ Claim(s) 2,3,8 and 10 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This is in response to amendment filed on March 10, 2004 (paper # 8). Applicant's arguments with respect to claim 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4-7, and 12 are rejected under 35 U.S.C. 103(a) as being obvious over Bustini (U.S. Patent 5,313,454) in view of Galand (U.S. Patent 5,838,922).

Regarding claim 1, Bustini'454 discloses a network of nodes (see FIG. 7, Node A, B, and C) connected to each other via bidirectional links (see FIG. 7; Cell Virtual Connection 182 connects the nodes), each of said nodes having a buffer for storing packets prior to transmission toward an ultimate destination (see FIG. 7; TXR 56 and FRP 59 queues/stores the packets before transmission; see col. 11, lines 30-34), a method to control congestion on each of said links, said method comprising the steps of:

assigning a priority level from amongst at least two possible priority levels, to packets stored in a sending node X_1 buffer (see FIG. 7, a buffer of Node A; col. 6, line 26-30; see col.

7, lines 34-59; note that each node assigns the priorities for servicing and queuing/storing levels/criteria for plurality of traffic classes (i.e. high priority (HP), voice, low speed statistical (LSS), high speed deterministic (HSD)));

transmitting upstream, via said link l (see FIG. 7, Cell Virtual Connection 182), a feedback value f_l (see FIG. 7, ICA Rate Control Feedback message 180; see col. 22, lines 5-59; note that ICA message contains the indicated value of buffer condition, thus, ICA message is a feed back value) from said receiving node R_1 (see FIG. 7; Node C), to said sending node X_l, said feedback value f_1 being indicative of the ability of said receiving node R_l to store said packet in said receiving node R_l buffer (see col. 11, line 45-69; note that Node C detects the congestion status when queuing/storage of the cells exceed the threshold, and the ICA message is fed back to Node A to relieve the congestion);

transmitting downstream from said sending node X_1 to said receiving node R_l, via said link 1, only those packets stored in said sending node X_l buffer (see FIG. 16, step 516; col. 12, line 54-61; see col. 18, lines 35-44, 53-57; note that upon detecting the congestion, node A adjusts the rate and transmits the queued/stored cells.)

Bustini'454 does not explicitly disclose transmitting only those packets stored in said buffer (see Galand'922 FIG. 1, Input buffer 11) whose priority level (see Galand'922 col. 7, lines 14-20; Table TABG) equals or exceeds the feedback value f_l (see Galand'922 FIG. 1, Selected Back Pressure, SBP; see col.6, lines 42-67; col. 7, line 20-43; note that when the output is congested, an SBP message is send for a particular/selected priority of traffic (e.g. SBP with T(nrt), MBP/QPB=1 for non reserve traffic). After receiving the SBP, the stored/queued packets for other priority of traffics (e.g. real time reserved RT traffic or non-

real time reserved NRT traffic) whose priority level exceeds the feedback SBP's priority (e.g. RT traffic priority, MBP/QBP=3 or NRT traffic priority, MBP/QPB=2) are transmitted towards the output. Note that RT and NRT traffic priority levels exceed the feedback NR traffic priority.)

This limitation is taught by Galand'922. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bustini'454 as taught by Galand'922 for the purpose of providing a mechanism of congestion monitoring by transmitting cells whose priorities exceed the selected traffic priority of back pressure, since Galand'922 teaches in col. 6, line 31-39 such modification will improve the buffer sharing system with a backpressure signal. The motivation being that by selectively sending the traffic based upon the selected backpressure message's priority, it can increase buffer utilization and achieve better network performance.

Regarding claims 4 and 5, both Bustini'454 and Galand'922 disclose said packets stored in said sending node X_l buffer whose priority level equals λ_p or exceeds the feedback value f_l are designated as eligible packets as described in Claim 1 above. Moreover, Bustini'454 discloses processing said eligible packets in accordance with a prioritization algorithm operates on a first-in/first out basis (see FIG. 12; Received Packet FIFO 90, Packet Information FIFO 152, and Packet Start Address FIFO 124; see col. 16, line 53-56; note that T1 transmitter/receivers process the packets according to FIFO prioritization algorithm basic).

Regarding claim 6, Bustini'454 discloses prioritization algorithm operates on a round robin basis (see FIG. 8, Credit Manager 809 and Cell Transmitter 807; col. 24, line 15-24; note that the credit manager assigns credits each channel/traffic in accordance with the congestion/availability and services by round-robin algorithm basis).

Regarding claim 7, Bustini'454 discloses feedback value f_i is determined by setting in the buffer at the receiving node R_I thresholds B_i (see col. 21, lines 32-65, step 2; note that threshold parameters for MIR, paragraph IR, QIR,T, VCqd, Bc, Be, Cmax, ECNth,That, and PQth) that limit the maximum amount of space for packets with priority levels λ^d less than or equal to i, (see function steps 1-6 at col. 21, line 31-67 to col.22, line1-10; note that the ICA is configurable on a per connection basis. Thus, the threshold limits the maximum amount of space for cells with priority levels);

monitoring the priority levels λ^d of arriving and departing packets and the total space in the buffer at R_I occupied by packets of various priority levels λ^d (see FIG. 14A; step 406,420 and 422; see col. 20, line 32-37; note that in the system checks/monitors the priority order index/levels of each transmit and receive cells, the cells in the queues, and the spare bandwidth/space available),

increasing priority levels λ_p of previously-stored packets (see FIG. 16, step 500; see col. 24, line 6-7; note the if ICA request is to increase the rate, the priority level of stored packets associated with the rate is increased); and

transmitting from the receiving node R_I to the sending node X_I a feedback value f_i that represents the lowest priority level of packets that the receiving node Rl could accept without

violating any of the Bi buffer threshold constraints (see col. 22, line 53-59; see col. 21, line 24-26; the ICA message from node C to source node A includes the lowest/minimum guarantee allocated bandwidth and priority for each traffic type which will not cross the threshold).

Regarding claim 12, Bustini '454 discloses a network of nodes (see FIG. 7; Node A, B, and C) connected to each other via bidirectional links (see FIG. 7; Cell Virtual Connection 182), each of said nodes having a buffer for storing packets prior to transmission toward an ultimate destination (see FIG. 7; TXR 56 and FRP 59), a method to provide feedback from receiving nodes to sending nodes (see FIG. 7, Node A and C), to control packet transmission such that packets are not lost, and transmission of packets can occur without creating overflow in said buffers and without creating deadlocks or livelocks, said method comprising the steps of:

assigning a priority level from amongst at least two possible priority levels, to packets stored in a sending node X_l buffer (see FIG. 7, a buffer of Node A; col. 6, line 26-30; see col. 7, lines 34-59; note that each node assigns the priorities for servicing and queuing/storing levels/criteria for plurality of traffic classes (i.e. high priority (HP), voice, low speed statistical (LSS), high speed deterministic (HSD)));

transmitting upstream, via said link l (see FIG. 7, Cell Virtual Connection 182), a feedback value f_l (see FIG. 7, ICA Rate Control Feedback message 180; see col. 22, lines 5-59; note that ICA message contains the indicated value of buffer condition, thus, ICA message is a feed back value) from said receiving node R_l (see FIG. 7; Node C), to said

sending node X_l, said feedback value f_l being indicative of the ability of said receiving node R_l to store said packet in said receiving node R_l buffer (see col. 11, line 45-69; note that Node C detects the congestion status when queuing/storage of the cells exceed the threshold, and the ICA message is fed back to Node A to relieve the congestion);

transmitting downstream from said sending node X_1 to said receiving node R_l, via said link 1, only those packets stored in said sending node X_l buffer (see FIG. 16, step 516; col. 12, line 54-61; see col. 18, lines 35-44, 53-57; note that upon detecting the congestion, node A adjusts the rate and transmits the queued/stored cells);

periodically adjusting said feedback value f_l (see col. 12, line 54-61; note that the value in ICA message is adjusted periodically into four-state rate message: increase, decrease, large decrease, and no-change).

Bustini'454 does not explicitly disclose transmitting only those packets stored in said buffer (see Galand'922 FIG. 1, Input buffer 11) whose priority level (see Galand'922 col. 7, lines 14-20; Table TABG) equals or exceeds the feedback value f_l (see Galand'922 FIG. 1, Selected Back Pressure, SBP ; see col.6, lines 42-67; col. 7, line 20-43; note that when the output is congested, an SBP message is send for a particular/selected priority of traffic (e.g. SBP with T(nrt), MBP/QPB=1 for non reserve traffic). After receiving the SBP, the stored/queued packets for other priority of traffics (e.g. real time reserved RT traffic or non-real time reserved NRT traffic) whose priority level exceeds the feedback SBP's priority (e.g. RT traffic priority, MBP/QBP=3 or NRT traffic priority, MBP/QPB=2) are transmitted towards the output. Note that RT and NRT traffic priority levels exceed the feedback NR traffic priority; and

periodically adjusting said priority level λ_p (see Galand'922 col. 7, line 20-43; note that priority level is adjusted based upon the selected back pressure signal message).

This limitation is taught by Galand'922. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bustini'454 as taught by Galand'922 for the purpose of providing a mechanism of congestion monitoring by transmitting cells whose priorities exceed the selected traffic priority of back pressure, since Galand'922 teaches in col. 6, line 31-39 such modification will improve the buffer sharing system with a backpressure signal. The motivation being that by selectively sending the traffic based upon the selected backpressure message's priority, it can increase buffer utilization and achieve better network performance.

3. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being obvious over Bustini (U.S. Patent 5,313,454) and Galand'922, and further in view of Dally (U.S. 4,933,933).

Regarding Claims 9 and 13, Bustini'454 discloses the step of a packet communication network comprised of interconnected nodes arranged to transmit variable length pack is to adjacent nodes (see FIG. 7; Node A, B, and C), wherein each node includes a buffer for storing packets enroute from source node to a destination node (see FIG. 7; TXR 56 and FRP 59), a method of controlling the transmission of a packet p from a sending node X_l (see FIG. 7; Node A) to a receiving node R_l (see FIG. 7, Node C), via a link l (see FIG. 7, Cell Virtual Connection 182), said method comprising the steps of

sending from the receiving node R_l to the sending node X_l a feedback level f_l (see FIG. 7, ICA feedback signal message 180) such that there will be room in the buffer in the

receiving node Rl to store packets subsequently received from the upstream node X_l;(see col. 11, line 45-69, see col. 12, line 54-61; note that ICA message from node C is fed back to source node A to adjusted the transmission in order to relieve the congestion in the buffer and to ensure the subsequent/next packets received at node C from node A will have minimum bandwidth);

assigning a priority level X_l to packets stored in the buffer of the receiving node R_l (see FIG. 7, a buffer of Node C; col. 6, line 26-30; see col. 7, lines 34-59; note that each node assigns the priorities for servicing and queuing/storing levels/criteria for plurality of traffic classes (i.e. high priority (HP), voice, low speed statistical (LSS), high speed deterministic (HSD))); and

transmitting downstream from said sending node X_l to said receiving node R_l, via said link 1, only those packets stored in said sending node X_l buffer (see FIG. 16, step 516; col. 12, line 54-61; see col. 18, lines 35-44, 53-57; note that upon detecting the congestion, node A adjusts the rate and transmits the queued/stored cells.)

Bustini'454 does not explicitly disclose transmitting only those packets stored in said buffer (see Galand'922 FIG. 1, Input buffer 11) whose priority level (see Galand'922 col. 7, lines 14-20; Table TABG) equals or exceeds the feedback value f_l (see Galand'922 FIG. 1, Selected Back Pressure, SBP; see col.6, lines 42-67; col. 7, line 20-43; note that when the output is congested, an SBP message is send for a particular/selected priority of traffic (e.g. SBP with T(nrt), MBP/QPB=1 for non reserve traffic). After receiving the SBP, the stored/queued packets for other priority of traffics (e.g. real time reserved RT traffic or non-real time reserved NRT traffic) whose priority level exceeds the feedback SBP's priority (e.g.

RT traffic priority, MBP/QBP=3 or NRT traffic priority, MBP/QPB=2) are transmitted towards the output. Note that RT and NRT traffic priority levels exceed the feedback NR traffic priority.)

This limitation is taught by Galand'922. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Bustini'454 as taught by Galand'922 for the purpose of providing a mechanism of congestion monitoring by transmitting cells whose priorities exceed the selected traffic priority of back pressure, since Galand'922 teaches in col. 6, line 31-39 such modification will improve the buffer sharing system with a backpressure signal. The motivation being that by selectively sending the traffic based upon the selected backpressure message's priority, it can increase buffer utilization and achieve better network performance.

Neither Bustini'454 nor Galand'922 explicitly discloses all packets destined for the same destination have the same priority level and packets closer to their destination have a higher priority level (see Dally'933 abstract, lines 4-11, see col. 5, lines 31-34; note that packets traversing the same channel (i.e. towards the same destined node) are assigned a same priority, and the packet's priority increases as they move closer and closer to its destination.)

This limitation is taught by Dally'933. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Bustini'454 and Galand'922, as taught by Dally'933 for the purpose of providing the mechanism for assigning the packets traversing the same destination with the same priority and increase the priority as they move closer to the destination, since Dally'933 states in col.

2, line 12-22 that it will provide deadlock-free routing. The motivation being that by assigning the packets with the destination with the same priority and increases the priority as they moves closer to destination, it can reduce the latency of communication time since packet's priority is increase by moving faster towards the destination.

Allowable Subject Matter

4. Claim 11 is allowed.
5. Claims 2,3,8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Notes/Remarks

6. Objection to the drawings is withdrawn since it is being amended accordingly.
7. Claim rejections under 35 USC § 112, second paragraph, on claims 2,3,7-11 are withdrawn.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 703-605-1531. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpyue can be reached on 703-308-7828. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM
4/1/04

KENNETH VANDERPUYE
PRIMARY EXAMINER